

Amendments to the Claims

The listing of claims will replace all prior versions, and listings of claims in the application.

1. (Currently Amended) A circuit which decouples gains for a transmit signal and a receive signal of a broadband modem that is coupled to a telephone line ~~and which isolates narrowband voice signals from broadband signals~~, comprising:

a multi-port transformer including

- i) a line coil electrically coupled to the telephone line, ~~wherein said line coil includes a first line coil, a line capacitor and a second line coil;~~
- ii) a linedriver coil electrically coupled to a broadband modem transmit line carrying the transmit signal of the broadband modem, ~~wherein said linedriver coil includes a first linedriver coil, a linedriver capacitor and a second linedriver coil;~~
- iii) a receive coil electrically coupled to a broadband modem receive line carrying the receive signal of the broadband modem, ~~wherein said receive coil includes a first receive coil and a second receive coil, wherein a node between the first receive coil and the second receive coil is coupled to ground;~~
- iv) wherein said line coil, said linedriver coil and said receive coil are magnetically coupled to each other;

a bridge circuit electrically coupled between said multi-port transformer and the broadband modem receive line; and

a pair of line matching resistors electrically coupled between said multi-port transformer and the broadband modem transmit line, wherein each of the line matching resistors match the telephone line resistance;

wherein a turns ratio of said linedriver coil to said line coil is 1:N and a turns ratio of said receive coil to said line coil is M:N.

2. (Canceled)

3. (Currently Amended) A The circuit of claim 1, wherein said bridge circuit is coupled to the broadband modem transmit line and subtracts the transmit signal from the receive signal.

4. (Currently Amended) A The circuit of claim 1, wherein the broadband modem is an ADSL modem.

5. (Currently Amended) A The circuit of claim 1, wherein the broadband modem is a VDSL modem.

6. (Currently Amended) A The circuit of claim 1, wherein the broadband modem is a HDSL modem.

7. (Canceled)

8. (Currently Amended) A broadband modem for coupling a broadband signal to a telephone line, comprising:

a transmit circuit that provides a modem transmit signal;

a receive circuit that receives a modem receive signal;

a hybrid circuit coupled to said transmit circuit and said receive circuit which decouples gains for the modem transmit signal and the modem receive signal ~~and~~

~~which isolates narrowband voice signals from broadband signals, wherein said hybrid circuit comprises:~~

a multi-port transformer including

- i) a line coil electrically coupled to the telephone line, ~~wherein said line coil includes a first line coil, a line capacitor and a second line coil;~~
- ii) a linedriver coil electrically coupled to a broadband modem transmit line carrying a transmit signal of said transmit circuit; ~~wherein said linedriver coil includes a first linedriver coil, a linedriver capacitor and a second linedriver coil;~~
- iii) a receive coil electrically coupled to said receive circuit carrying a receive signal of the receive circuit; ~~wherein said receive coil includes a first receive coil and a second receive coil, wherein a node between the first receive coil and the second receive coil is coupled to ground;~~
- iv) ~~wherein said line coil, said linedriver coil and said receive coil are magnetically coupled to each other;~~

~~a bridge circuit electrically coupled between said multi-port transformer and said receive circuit; and~~

~~a pair of line matching resistors electrically coupled between said multi-port transformer and said transmit circuit, wherein each of the line matching resistors match the telephone line resistance~~

wherein within said hybrid circuit a turns ratio of said linedriver coil to said line coil is 1:N and a turns ratio of said receive coil to said line coil is M:N.

9. (Canceled)
10. (Canceled)
11. (Currently Amended) A The broadband modem of claim 8, wherein the broadband signal is an ADSL signal.
12. (Currently Amended) A The broadband modem of claim 8, wherein the broadband signal is a VDSL signal.
13. (Currently Amended) A The broadband modem of claim 8, wherein the broadband signal is a HDSL signal.
14. (New) The circuit of claim 1, wherein said multi-port transformer isolates narrowband voice signals.
15. (New) The circuit of claim 14, wherein
 - i) said line coil includes a first line coil, a line capacitor and a second line coil,
 - ii) wherein said linedriver coil includes a first linedriver coil, a linedriver capacitor and a second linedriver coil,
 - iii) wherein said receive coil includes a first receive coil and a second receive coil, wherein a node between the first receive coil and the second receive coil is coupled to ground.
16. (New) The broadband modem of claim 8, wherein said hybrid circuit further comprises:
 - a bridge circuit electrically coupled between said multi-port transformer and said receive circuit; and

a pair of line matching resistors electrically coupled between said multi-port transformer and said transmit circuit, wherein each of the line matching resistors match the telephone line resistance.

17. (New) The circuit of claim 8, wherein said multi-port transformer isolates narrowband voice signals.
18. (New) The circuit of claim 17, wherein
 - i) said line coil includes a first line coil, a line capacitor and a second line coil,
 - ii) wherein said linedriver coil includes a first linedriver coil, a linedriver capacitor and a second linedriver coil,
 - iv) wherein said receive coil includes a first receive coil and a second receive coil, wherein a node between the first receive coil and the second receive coil is coupled to ground.